

IN THE CLAIMS

Please cancel original claims 1-37 without prejudice or disclaimer, and add the following new claims 38-62.

Claims 1-37 (canceled).

38. (NEW) A method for removing a deposit accumulated in an apparatus for producing a semiconductor device, said method comprising bringing a cleaning gas into contact with said deposit accumulated in an apparatus for producing a semiconductor device, thereby removing said deposit by a gas-solid reaction,

wherein said cleaning gas comprises a hypofluorite.

39. (NEW) A method according to claim 38, wherein said hypofluorite is a compound having at least one OF group in the molecule and optionally having at least one group selected from the group consisting of halogen atoms, ether groups, alcohol groups, carbonyl groups, carboxyl groups, ester groups, amine groups, and amide groups.

40. (NEW) A method according to claim 39, wherein said hypofluorite is selected from the group consisting of CF_3OF , $\text{CF}_2(\text{OF})_2$, $\text{CF}_3\text{CF}_2\text{OF}$, CH_3COOF , $(\text{CF}_3)_3\text{COF}$, $\text{CF}_2\text{HCF}_2\text{OF}$, $(\text{CF}_3\text{CF}_2)(\text{CF}_3)_2\text{COF}$, CH_3OF , CFH_2OF , CFH_2OF , CF_2HOF , $\text{CF}_3\text{CF}_2\text{CF}_2\text{OF}$, and $(\text{CF}_3)_2\text{CFOF}$.

41. (NEW) A method according to claim 40, wherein said cleaning gas further comprises an inert gas.

42. (NEW) A method according to claim 40, wherein said deposit is selected from the group consisting of B, P, W, Si, Ti, V, Nb, Ta, Se, Te, Mo, Re, Os, Ru, Ir, Sb, Ge, Au, Ag, As and Cr, and oxides, nitrides, carbides and alloys of these elements.

43. (NEW) A method according to claim 40, wherein said cleaning gas comprises 1-100 volume % of said hypofluorite.

44. (NEW) A method according to claim 43, wherein said cleaning gas further comprises at least one gas component selected from the group consisting of oxygen and oxygen-containing gases.

45. (NEW) A method according to claim 44, wherein said at least one gas component is in an amount from 0.4 to 90 volume% based on a total volume of said at least one gas component and said hypofluorite.

46. (NEW) A method according to claim 44, wherein said oxygen-containing gases are selected from the group consisting of CO₂, CO, NO, NO₂, and N₂O.

47. (NEW) A method according to claim 38, wherein said cleaning gas is at a temperature from 10 to 700°C.

48. (NEW) A method according to claim 38, wherein said cleaning gas has a pressure from 0.1 to 760 Torr when said removing said deposit is a plasma-less cleaning, or a pressure from 1 mTorr to 10 Torr when said removing said deposit is a plasma-assisted cleaning.

49. (NEW) A method for removing a portion of a film deposited on a substrate for producing thin film devices, said method comprising bringing an etching gas into contact with said portion of said film, thereby removing said portion by a gas-solid reaction,
wherein said etching gas comprises a hypofluorite.

50. (NEW) A method according to claim 49, wherein said hypofluorite is a compound having at least one OF group in the molecule and optionally having at least one group selected from the group consisting of halogen atoms, ether groups, alcohol groups, carbonyl groups, carboxyl groups, ester groups, amine groups, and amide groups.

51. (NEW) A method according to claim 50, wherein said hypofluorite is selected from the group consisting of CF₃OF, CF₂(OF)₂, CF₃CF₂OF, CH₃COOF, (CF₃)₃COF, CF₂HCF₂OF, (CF₃CF₂)(CF₃)₂COF, CH₃OF, CFH₂OF, CFH₂OF, CF₂HOF, CF₃CF₂CF₂OF and (CF₃)₂CFOF.

52. (NEW) A method according to claim 49, wherein said etching gas further comprises an inert gas.

53. (NEW) A method according to claim 49, wherein said film is made of a material selected from the group consisting of B, P, W, Si, Ti, V, Nb, Ta, Se, Te, Mo, Re, Os, Ru, Ir, Sb, Ge, Au, Ag, As and Cr, and oxides, nitrides, carbides and alloys of these elements.

54. (NEW) A method according to claim 49, wherein said etching gas further comprises at least one first gas component selected from the group consisting of hydrogen and hydrogen-containing gases.

55. (NEW) A method according to claim 54, wherein said hydrogen-containing gases are selected from the group consisting of CH₄, NH₃, HI, HBr, C₂H₂, and HCl.

56. (NEW) A method according to claim 54, wherein a ratio by volume of said hypofluorite to said at least one first gas component is at least 1:10.

57. (NEW) A method according to claim 49, wherein said etching gas further comprises at least one second gas component selected from the group consisting of oxygen and oxygen-containing gases.

58. (NEW) A method according to claim 57, wherein said oxygen-containing gases are selected from the group consisting of CO, NO, N₂O and NO₂.

59. (NEW) A method according to claim 57, wherein a volume ratio of said hypofluorite to said at least one second as component is at least 1:4.

60. (NEW) A method according to claim 49, wherein said etching gas has a pressure from 0.001 Torr to 5 Torr.

61. (NEW) A method according to claim 49, wherein said etching gas is at a temperature of not higher than 400°C.

62. (NEW) A method according to claim 49, wherein a flow rate of said etching gas is from 10 to 10,000 standard cubic centimeters per minute.